

REMARKS/ARGUMENTS

Reconsideration of this application is respectfully requested in view of the foregoing amendments and discussion presented herein.

1. **Rejections under 35 U.S.C. § 112, first paragraph.**

In the Office Action mailed May 18, 2006, the Examiner states:

Claims 2-37 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contain subject matter which was not described in such a way that as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The claims as amended now recite that the edge portion of the separator plate is rolled, bent over or crimped *over the edge of said flexible membrane*. There is no clear support for this arrangement as recited in the amendment and therefore raises new matter.

The only statement in the original disclosure as to the relationship between the separator and the MEA is that the separator is bent, rolled, or crimped "against" the MEA (page 11, ll. 8-11). The specification does not define the degree or extent of how exactly the separator is bent, rolled or crimped "against" the MEA and absent such cannot be held to sufficiently teach the particular arrangement as defined in claims 2-37 (in particular, the specification lacks sufficient description to support the amendment to claims 2 and 23 as to the separator being bent over or crimped *over the edge of said flexible membrane assembly*). Further the drawings fail to show this arrangement and lack support for this description since the figures showing the bent separator fail to include the MEA and thus lack sufficient disclosure to show the relationship defined in claims 2-37. (emphasis in original)

In response to the claim of new matter, Claims 2 and 23 have been amended to explicitly recite language contained in the original specification.

Claim 2, as now amended, states that the "edge portion of the flexible or ridged bipolar separator plate is *bent over or rolled and/or crimped over said sealed edge portions of said flexible membrane electrode assembly*" (emphasis added). The phrase "said sealed edge portions of said flexible membrane electrode assembly" refers to the

portion of Claim 2 stating: "wherein said flexible seal, adhesive or gasket seals the edge portions of said flexible membrane assembly", and thus has antecedent basis.

Claim 23, as now amended, states that the "perimeter edge portion of the BSP is *bent over, or rolled and/or crimped over the edge of the MEA*".

Support for this amendment is found in pages 10 and 11, and in FIGS. 6, 7A-B, and 9A-D. Initially, the Examiner's kind attention is directed to the statement at page 11, lines 9-11: "...the edges of the flexible or ridged bipolar separator plate 61 can be bend [sic] over or rolled and/or crimped against the sealing service [sic] of the membrane electrode assembly." Specifically, the original specification here states that the edges of the BSP can be "bent over", or "rolled" and/or "crimped against" the sealing surface of the MEA.

Further, lines 13-15 state that "Figures 9A and 9C show a flexible or ridged bipolar separator plate 61 with extended edges 90, 91 *before being rolled or crimped over the sealing edge* as shown in Figures 9B and 9D." (emphasis added). The "sealing edge" must refer to the edge of the MEA, because it is only at the edges of the MEA where sealing can take place (see discussion of this in the next paragraph). The middle portion of the MEA is the active membrane portion (reference numeral 56). Thus, the original specification here states that the edges of the BSP are "rolled or crimped over" the edge of the MEA.

Still further, lines 15-18 state that "There are numerous methods for achieving the desired effect of *mechanically restraining the edge* of the adhesives or gaskets in order to prevent the release of reactants from the fuel cell well known to those trained in the mechanical arts" (emphasis added). Kindly refer to page 10, lines 10-12, which states that the present invention "utilizes adhesives or gaskets with adhesive seals between the MEA 65 and single BSP 61. Figures 7A and 7B show an adhesive 66, with or without a carrier gasket 64, to bond the MEA 65 to the hydrogen side of the BSP 61." The edges of the adhesives, seals, or gasket (i.e., "sealing edge" at page 11, lines 14-15) must also be the edges (or periphery) of the MEA, because the active membrane

portion (reference numeral 56) of the MEA would not be sealed to anything. Thus, the edge of the adhesive or gasket ("sealing edge"), as shown in FIGS. 7A-B, is coextensive with the edge (or periphery) of the MEA.

Therefore, the specification text is abundantly clear that it is the edge of the MEA that is being acted upon: the edges of the BSP are bent over the edges of the MEA (lines 9-10); or the edges of the BSP are rolled over or against edges the MEA (lines 10, 14, 20, 23); or the edges of the BSP are crimped over the edge of the MEA (line 14); or the edges of the BSP are crimped against the edges of the MEA (line 10). The edge (or periphery) of the MEA is the only available surface for sealing; the middle portion of the MEA is the active membrane portion (reference numeral 56), which would not be attached to anything. One of ordinary skill in the art would necessarily reach this conclusion.

Claims 2 and 23, as amended, do not contain new matter, because the original specification explicitly states that the edges of the adhesives or gaskets are mechanically restrained using these particular methods, "to prevent the release of reactants from the fuel cell", as stated in the claim. Conventional fuel cell technology, as noted at page 8, lines 36-37, utilizes "manifold and membrane sealing" in prior art fuel stacks. One of ordinary skill in the art would certainly be aware of the need to prevent the release of reactants from the fuel cell.

Regarding the "degree or extent of how exactly the separator is bent, rolled or crimped", it is respectfully submitted that such details are well known in the art and need not be explicitly recited in the specification to avoid a claim of new matter. One of ordinary skill in the art would be aware of the need to prevent the release of reactants, and would also be aware of the degree of interaction (e.g., bending over, or rolling and/or crimping against) between the edges of the BSP and the sealing surface of the MEA that is necessary "to support the sealing of the gaskets and/or sealing adhesives" (page 11, line 8).

The Examiner further states:

Claims 2-37 are rejected under 35 U.S.C. § 112, first paragraph, because the specification, while being enabling for bending, rolling or crimping the separator against the MEA, does not reasonably provide enablement for the separator being bent over or crimped *over the edge of said flexible membrane assembly*. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with the claims.

As noted hereinabove, the specification text is abundantly clear that it is the edge (or periphery) of the MEA that is being acted upon: the edges of the BSP are bent over the edges of the MEA (page 11, lines 9-10); or the edges of the BSP are rolled over or against edges the MEA (lines 10, 14, 20, 23); or the edges of the BSP are crimped over the edge of the MEA (line 14); or the edges of the BSP are crimped against the edges of the MEA (line 10). The periphery of the MEA is the only available surface for sealing; the middle portion of the MEA is the active membrane portion (reference numeral 56), which would not be attached to anything. One of ordinary skill in the art would necessarily reach this conclusion.

Referring again to FIGS. 9A-9D, which are noted in the specification as being pictured *without the MEA*, the proper placement of the MEA in FIGS. 9A-9D produces new figures 10A-10D. With respect to the bending over of the edges shown in FIGS. 9A-9D, the placement of the MEA in any other position would not make sense to one of ordinary skill in the art. No benefit would be gained if the edge of the MEA were placed against an edge of a BSP that is merely folded over onto itself. No "support [for] the sealing of the gaskets" would be performed by placing the MEA in this position. One of ordinary skill in the art would not be motivated to place the MEA anywhere other than in the position shown in new FIGS. 10A-10D, because one of ordinary skill in the art would be aware that the support functions would only be served with the MEA in the position shown in FIGS. 10A-10D. Thus, the specification provides ample support to one of ordinary skill in the art for the position of the MEA relative to the BSP when the bending

over or rolling and/or crimping" action is taken.

2. Drawings.

The Examiner has objected to the drawings for not showing every feature of the invention specified in the claims. New FIGS. 10A-D have been added, which show the BSP of FIGS. 9A-D with the MEA in place.

It is respectfully submitted that the addition of FIGS. 10A-D does not constitute new matter. The original specification, at page 11, lines 11-13, states that "Figures 9A, 9B, 9C and 9D illustrate a method for achieving this end, *shown without the MEA 64, gasket 64 for [sic] manifolds 51 for clarity*" (emphasis added). Moreover, the original specification, at page 10, lines 9-12, states:

the modular design shown in Figures 5A, 5B, 5C, 6, 7A and 7B, utilizes adhesives or gaskets with adhesive seals between the MEA 65 and single BSP 61. Figures 7A and 7B show an adhesive 66, with or without a carrier gasket 64, to bond the MEA 65 to the hydrogen side of the BSP 61.

Thus, the MEA is bonded to the BSP, with or without a gasket between them. See, for example, FIGS. 5A, showing the obverse of the BSP/MEA/manifold, in which the MEA is visible on the exterior (numeral 56 denotes the active membrane), and FIG. 5B, showing the reverse of the same BSP/MEA/manifold, in which the BSP 61 is visible. In addition, see FIG. 6, showing an exploded view of the same BSP/MEA/manifold, in which the BSP and MEA are shown as the ends of the BSP/MEA sandwich; and FIGS. 7A-B, showing the bonding orientation of the BSP and MEA within the BSP/MEA/manifold. It is clear that placement of the MEA in FIGS. 9A-D would result in FIGS. 10A-D. No new matter has been added.

The specification has been amended to reflect the addition of FIGS. 10A-10D.

3. Provisional Double Patenting.

With respect to the provisional double patenting rejection, because it is now the sole remaining impediment to patentability of the instant application, the provisional rejection should be withdrawn, and the instant application should be allowed to issue. MPEP 804(I)(B).

4. Information Disclosure Statement.

The Applicant submits herewith an Information Disclosure Statement. U.S. Patent Nos. 6,087,033 (Grüne et al.); 6,207,310 (Wilson et al.); and 6,214,486 (Okamoto) were cited in a first Office Action on related application serial number 10/369,257.

Grüne et al. teaches fuel cells that “have no bipolar plates” (col. 3, ll. 54-55), and, therefore, cannot have either “a single flexible or ridged bipolar separator plate”, as explicitly required by Claim 2 or “a bipolar separator plate (“BSP”) having a perimeter edge portion” as required by Claim 23.

Wilson et al. discloses a polymer electrolyte membrane (PEM) fuel cell that uses “thin metal or carbon foils in place of conventional bipolar plates” (col. 4, ll. 28-29). Flow paths using fine screens, metal mesh, or perforated plates are described. Again, there are no bipolar plates. Otherwise, a fuel cell stack in Wilson et al. is fabricated in the same way that conventional fuel cells stacks are fabricated. Okamoto teaches a polymer electrolytic membrane (PEM) fuel cell or stack of PEM fuel cells that is fabricated in the same way that conventional fuel cells are fabricated. Sealing functions in the stack are accomplished through pressure acting on gaskets (30), (32) in the stack (col. 6, ll. 23-24, 42-29; col. 7, ll. 17-50). The separator plates are planar and perform no support functions for sealing the fuel cells.

Notably, in Application Serial Number 10/369,257 (the related application), claims similar in scope to those pending herein were rejected as being obvious based

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on Grüne et al. in view of Wilson et al. (Office Action dated February 22, 2006, pages 8-11). Certain other claims were rejected based on Grüne et al. in view of Wilson et al. and Okamoto. (Office Action dated February 22, 2006, pages 11-12). This notwithstanding, Applicants submit that the claims pending herein are patentable over Grüne et al., Wilson et al., and/or Okamoto, whether alone or in combination.

5. Correspondence.

The Office Action and the Advisory Action were inexplicably sent to Neil Steinberg, counsel or record for inventors Arikara and Bawden, rather than Daniel P. Maguire, counsel of record for inventors Franklin and Mettler, as set forth in the petition decision mailed on June 26, 2003. Undersigned is new counsel for inventors Franklin and Mettler, and is filing a new power of attorney herewith. Correspondence in this case should now be directed to John P. O'Banion, new counsel of record for inventors Franklin and Mettler.

6. Attorney Docket Number.

The Examiner's kind attention is directed to the docket number to be used for this application, ALT6089.04A.

7. Amendments Made Without Prejudice or Estoppel.

Notwithstanding the amendments made and accompanying traversing remarks provided above, Applicants have made these amendments in order to expedite allowance of the currently pending subject matter. However, Applicants do not acquiesce in the original ground for rejection with respect to the original form of these claims. These amendments have been made without any prejudice, waiver, or estoppel, and without forfeiture or dedication to the public, with respect to the original subject matter of the claims as originally filed or in their form immediately preceding these amendments. Applicants reserve the right to pursue the original scope of these

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claims in the future, such as through continuation practice, for example.

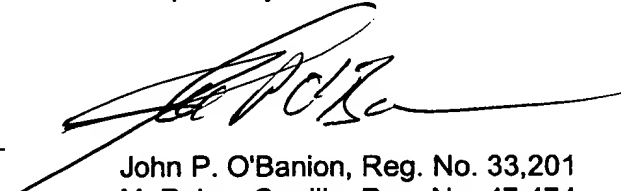
8. Conclusion.

Based on the foregoing, Applicants respectfully request that the various grounds for rejection in the Office Action be reconsidered and withdrawn with respect to the presently amended form of the claims, and that a Notice of Allowance be issued for the present Application to pass to issuance.

In the event any further matters remain at issue with respect to the present application, Applicants respectfully request that the Examiner please contact the undersigned below at the telephone number indicated in order to discuss such matter prior to the next action on the merits of this application.

Respectfully submitted,

Date: 8/29/06



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Attachment



CERTIFICATION UNDER 37 CFR 1.8

I hereby certify that the foregoing:

New Drawing Sheets (4)
(containing Figures 10A-10D)

is being deposited with the United States Postal Service on 9/29/06
with sufficient postage as first class mail in an envelope addressed to the:
Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

JOHN P. O'BANION

(Type or print name of person mailing paper)


(Signature of person mailing paper)